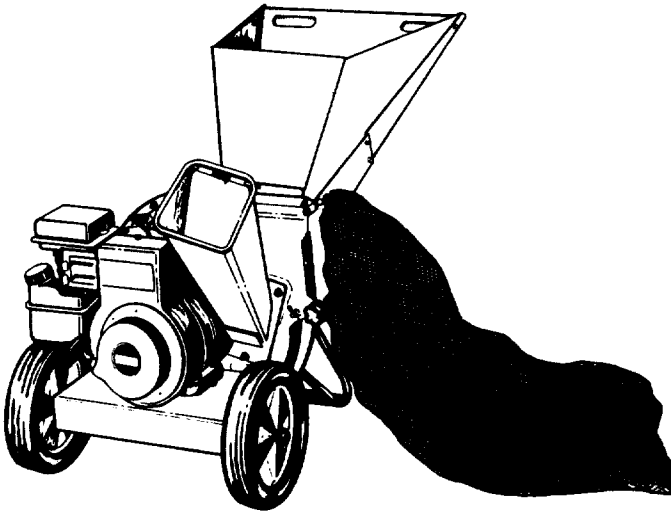


OWNER'S GUIDE

• ASSEMBLY • OPERATION • MAINTENANCE •



(Model 645C Shown)

**5 and 8 H.P.
SHREDDERS**

**Model Nos.
645C thru 651C**

IMPORTANT!

Record the exact **Model No.** and **Serial No.** which appear on the frame of your unit in the space below. You **must** have these numbers, along with the date of purchase, in order to receive warranty or service.

**Important:
Read Safety Rules
and Instructions Carefully**

MODEL NO.

SERIAL NO.

24 -6 C



Made
in
AMERICA


WARNING: This unit is equipped with an internal combustion engine and should not be used on or near any unimproved forest-covered, brush-covered or grass-covered land unless the engine's exhaust system is equipped with a spark arrester meeting applicable local or state laws (if any). If a spark arrester is used, it should be maintained in effective working order by the operator.

In the State of California the above is required by law (Section 4442 of the California Public Resources Code). Other states may have similar laws. Federal laws apply on federal lands. A spark arrester for the muffler is available through your nearest engine authorized service dealer or contact the service department, P.O. Box 368022, Cleveland, Ohio 44136-9722.

IMPORTANT

SAFE OPERATION PRACTICES



THIS SYMBOL POINTS OUT IMPORTANT SAFETY INSTRUCTIONS WHICH, IF NOT FOLLOWED, COULD ENDANGER THE PERSONAL SAFETY AND/OR PROPERTY OF YOURSELF AND OTHERS. READ AND FOLLOW ALL INSTRUCTIONS IN THIS MANUAL BEFORE ATTEMPTING TO OPERATE YOUR CHIPPER-SHREDDER. FAILURE TO COMPLY WITH THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY. WHEN YOU SEE THIS SYMBOL:  **HEED ITS WARNING.**



DANGER:

Your chipper-shredder was built to be operated according to the rules for safe operation in this manual. As with any type of power equipment, carelessness or error on the part of the operator can result in serious injury. This chipper-shredder is capable of amputating fingers and hands and throwing objects. Failure to observe the following safety instructions could result in serious injury or death.



I. GENERAL OPERATION

1. Read this owner's guide carefully in its entirety before attempting to assemble this machine. Read, understand, and follow all instructions on the machine and in the manual(s) before operation. Be completely familiar with the controls and the proper use of the machine before operating it. Keep this manual in a safe place for future and regular reference and for ordering replacement parts.
2. Your chipper-shredder is a powerful tool, not a plaything. Therefore, exercise extreme caution at all times. Your unit has been designed to perform two jobs; to chip and shred vegetation found in a normal yard. Do not use it for any other purpose.
3. Never allow children under age 16 to operate the unit. Children 16 years and older should only operate the unit under close parental supervision. Only responsible individuals who are familiar with these rules of safe operation should be allowed to use your unit.
4. Keep the area of operation clear of all persons, particularly small children and pets. Stop the engine when they are in the vicinity of the unit. Keep work area clean and clear of branches or obstacles which could cause you to stumble or fall.
5. When feeding material into this equipment, be extremely careful that pieces of metal, rocks, bottles, cans or other foreign objects are not included. Personal injury or damage to the machine could result.
6. Always wear safety glasses or safety goggles, during operation and while performing an adjustment or repair, to protect eyes from foreign objects that may be thrown from the machine.
7. Wear sturdy, rough-soled work shoes and close fitting slacks and shirt. Shirt and slacks that cover the arms and legs and steel-toed shoes are recommended. Do not wear loose fitting clothes or jewelry and secure hair so it is above shoulder length. They can be caught in moving parts. Never operate a unit in bare feet, sandals or sneakers. Wear gloves when feeding material in the chipper chute or shredder hopper.
8. Never place your hands, feet, or any part of your body into the shredder hopper, chipper chute, discharge opening, or near any moving part while the engine is running. Keep clear of the discharge opening at all times. If it becomes necessary to push material into the chipper chute or shredder hopper, use a small diameter stick, **NOT YOUR HANDS.**
9. If it is necessary for any reason to unclog the feed intake or discharge openings or to inspect or repair any part of the machine where a moving part can come in contact with your body or clothing, stop the machine, allow it to cool, disconnect the spark plug wire from the spark plug and move it away from the spark plug before attempting to unclog, inspect or repair.
10. Do not operate unit while under the influence of alcohol or drugs.
11. The machine should only be operated on a level surface. Never operate your unit on a slippery, wet, muddy or icy surface. Keep your work area clean and clear of branches or obstacles which could cause you to stumble and fall. Do not overreach. Maintaining proper footing and balance is essential to preventing accidents.
12. Do not allow an accumulation of processed material to build-up in the discharge area as this will prevent proper discharge and can result in kick-back from the chipper chute.
13. Keep your face and body back from chipper chute to avoid accidental bounce back of any material.
14. Do not transport machine while engine is running.
15. If the cutting mechanism strikes a foreign object or if your machine should start making an unusual noise or vibration, immediately stop the engine and allow the machine to come to a complete stop. Disconnect the spark plug wire and move it away from the spark plug. Take the following steps.
 - Inspect for damage.
 - Repair or replace any damaged parts.
 - Check for any loose parts and tighten to assure continued safe operation.
16. Never attempt to attach or remove catcher bag when engine is running. Shut the engine off and wait for the impeller to come to a complete stop. The impeller continues to rotate for a few seconds after the engine is shut off. Never place any part of the body in the impeller area until you are sure the impeller has stopped rotating.
17. Muffler and engine become hot and can cause a burn. Do not touch.
18. Do not allow leaves or other debris to build-up on engine's muffler. The debris could ignite and cause a fire.
19. Do not attempt to shred or chip material larger than specified in this manual. Personal injury or damage to the machine could result.
20. Do not operate engine if air cleaner or cover over carburetor air-intake is removed, except for adjustment. Removal of such parts could create a fire hazard.
21. Only use accessories approved for this machine by the manufacturer. Read, understand, and follow all instructions provided with the approved accessory.
22. If situations occur which are not covered by this manual, use care and good judgment. Contact your dealer for assistance.
23. Keep discharge chute deflector, chipper chute door, and all other guards and safety devices in place and operating properly.
24. Only operate unit in good daylight. Do not operate unit at night or in dark areas where your vision may be impaired.






II. CHILDREN

- Tragic accidents can occur if the operator is not alert to the presence of small children. Children are often attracted to the chipper-shredder and the chipping and shredding activity. Never assume that children will remain where you last saw them.
1. Keep children out of the work area and under the watchful eye of a responsible adult other than the operator.
 2. Be alert and turn the unit off if a child enters the area.
 3. Never allow children under the age of 16 to operate the chipper-shredder.

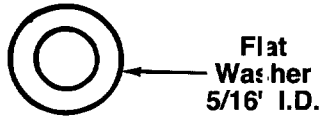
III. SERVICE

1. Use extreme care in handling gasoline and other fuels. They are extremely flammable and the vapors are explosive.
 - a. Store fuel and oil in approved containers, away from heat and open flame, and out of the reach of children. Check and add fuel before starting the engine. Never remove gas cap or add fuel while the engine is running. Allow engine to cool at least two minutes before refueling.
 - b. Replace gasoline cap securely and wipe off any spilled gasoline before starting the engine as it may cause a fire or explosion.
 - c. Extinguish all cigarettes, cigars, pipes and other sources of ignition.
 - d. Never refuel unit indoors because flammable vapors will accumulate in the area.
 - e. Never store the machine or fuel container inside where there is an open flame or spark such as a gas hot water heater, space heater, clothes dryer or furnace.
2. Never run your machine in an enclosed area as the exhaust from the engine contains carbon monoxide, which is an odorless, tasteless and deadly poisonous gas.
3. To reduce fire hazard, keep engine and muffler free of leaves, grass, and other debris build-up. Clean up fuel and oil spillage. Allow unit to cool at least 5 minutes before storing.
4. Before cleaning, repairing, or inspecting, make certain the impeller and all moving parts have stopped. Disconnect the spark plug wire and keep wire away from spark plug to prevent accidental starting. Do not use flammable solutions to clean air filter.
5. Check the blade and engine mounting screws at frequent intervals for proper tightness. Also visually inspect blades for wear and/or damage (e.g., bent, cracked). Replace with blades which meet original equipment specifications.
6. Keep all nuts, bolts, and screws tight to be sure the equipment is in safe working condition.
7. Never tamper with safety devices. Check their proper operation regularly.
8. After striking a foreign object, immediately stop the engine, disconnect the spark plug wire from the spark plug, and thoroughly inspect the unit for any damage. Repair damage before starting and operating unit.
9. Do not alter or tamper with the engine's governor setting. The governor controls the maximum safe operating speed of the engine. Over-speeding the engine is dangerous and will cause damage to the engine and to other moving parts of the machine.

<p>OWNER'S MANUAL</p> 	<p>SAFETY LABEL</p> 	<p> WARNING — YOUR RESPONSIBILITY</p> <p>Restrict the use of this power machine to persons who read, understand and follow the warnings and instructions in this manual and on the machine.</p>
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ASSEMBLY INSTRUCTIONS

A ATTACHING THE UPPER GUIDE ASSEMBLY



Hex Bolt
5/16-18 x 8-3/8" Long

IMPORTANT: This unit is shipped **WITHOUT GASOLINE** or **OIL**. After assembly, see separate engine manual for proper fuel and engine oil recommendations.

NOTE: To determine right and left hand sides of your shredder, stand behind the unit with the engine the farthest away from you. See figure 6.

Your shredder has been completely assembled at the factory, except for the hopper assembly (hopper hood and upper guide extension have been sub-assembled), upper guide assembly, chute deflector and the catcher bag. The hardware pack and a pair of safety glasses are also included in the carton.

The hardware pack contains the parts shown in figure 1 (shown full size).

TO REMOVE SHREDDER FROM CARTON

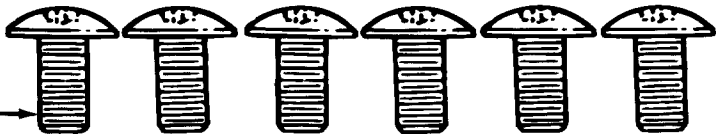
1. Remove staples, break glue on top flaps, or cut tape at carton end and peel along top flap to open carton.
2. Remove loose parts if included with unit (i.e., owner's manual, etc.).
3. Cut along dotted lines and lay carton down flat.
4. Remove packing material.
5. Roll or slide unit out of carton. Check carton thoroughly for loose parts.

TOOLS REQUIRED FOR ASSEMBLY

- (1) Phillips Screwdriver
- (2) 1/2" Wrenches (one must be a socket wrench)
- (2) 7/16" Wrenches or Adjustable Wrenches

B ATTACHING THE HOPPER ASSEMBLY

Truss Machine Screws 1/4-20 x 1/2" Long



Hex Lock Nuts 1/4-20 Thread



FIGURE 1.



WARNING: Make certain the spark plug wire is disconnected and moved away from the spark plug before assembling the shredder.

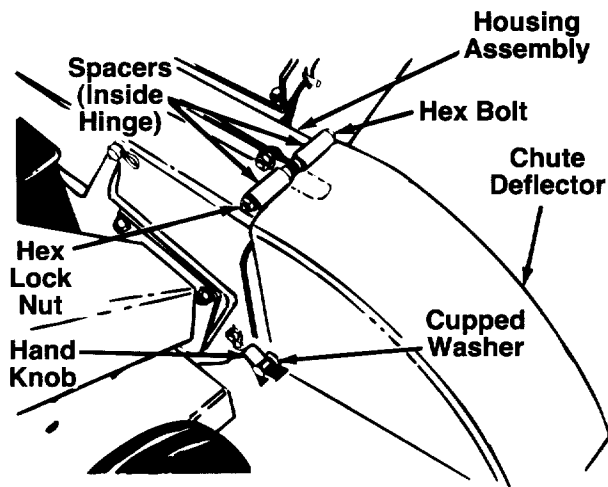


FIGURE 2.

ATTACHING THE CHUTE DEFLECTOR (See Figure 2)

1. Remove the hand knobs and cupped washers from each side of the discharge opening on the left side of the shredder.
2. Remove the hex lock nut, two spacers and hex bolt from inside the hinge on the housing assembly. Do not remove one spacer from the hex bolt.
3. Place the chute deflector in position on the discharge opening. Insert hex bolt and spacer through hinge on chute deflector and housing (spacer fits inside of hinge). See figure 2.
4. Place the second spacer over the hex bolt, inside the other part of the hinge. Secure with hex lock nut. Tighten securely.
5. Secure both sides of the chute deflector to the housing using the hand knobs and cupped washers (cupped side of washers go against the chute deflector).



WARNING: Do not operate this shredder unless the chute deflector has been properly installed and is secured with the hand knobs.

ATTACHING THE UPPER GUIDE ASSEMBLY (Hardware A)

Grasp the upper guide assembly from the sides and squeeze in and slide it over the inlet guide so the edges are under the stop washers. Adjust so the holes in the upper guide assembly are aligned with the holes in the inlet guide. Insert the hex bolt, 8-3/8" long through the upper guide assembly and the inlet guide. Secure with flat washer and lock nut.

NOTE: Make certain the upper guide assembly can pivot by lifting it up until it locks in the raised position. If it does not pivot freely, loosen the hex lock nut a turn or two and test.

ATTACHING THE HOPPER ASSEMBLY (Hardware B)

Your shredder has been shipped with the upper guide extension attached to the hopper assembly. See figure 4. Attach the hopper assembly to the upper guide assembly as follows. Be certain to place heads of all truss machine screws **inside** of hopper assembly.

1. Remove one truss machine screw and nut from each side of hopper assembly as shown in figure 4. **Push hopper pivot door down inside lower part of hopper** as you place hopper assembly (both pieces) **inside** upper guide assembly. Replace truss screws and nuts just removed, using the front upper hole in assembly as shown in figure 4, one on each side. Tighten finger tight only.

NOTE: You may have to squeeze in the sides of the hopper to start the screws. If you have difficulty aligning the holes, loosen the two screws on the upper end of the hopper assembly.

2. Place the six truss machine screws and nuts found in hardware pack in the remaining holes of hopper assembly, alternating sides of the unit and tightening finger tight only.
3. After assembling all eight screws, tighten them securely.

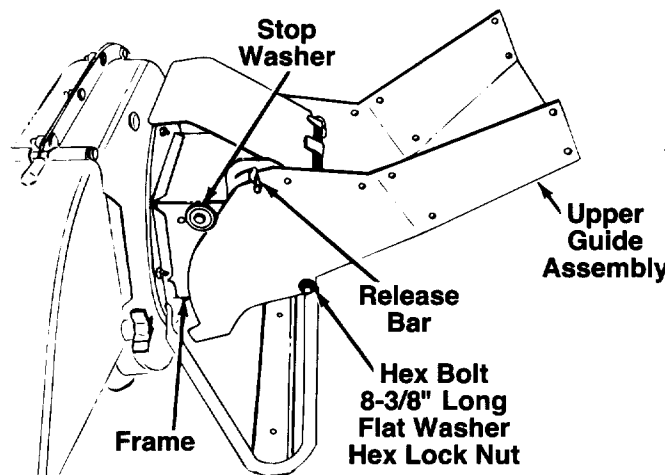


FIGURE 3.

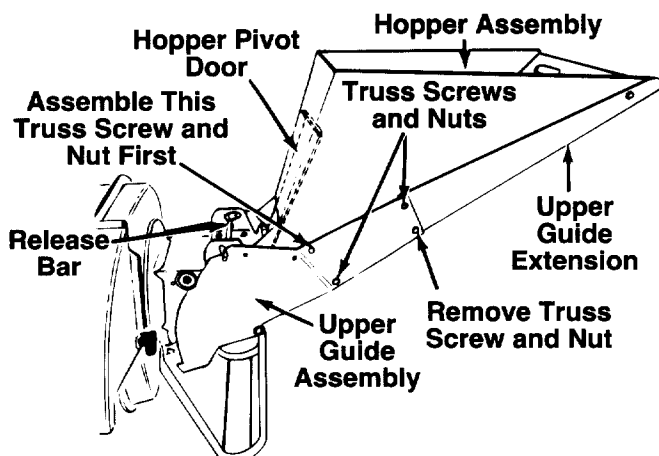


FIGURE 4.

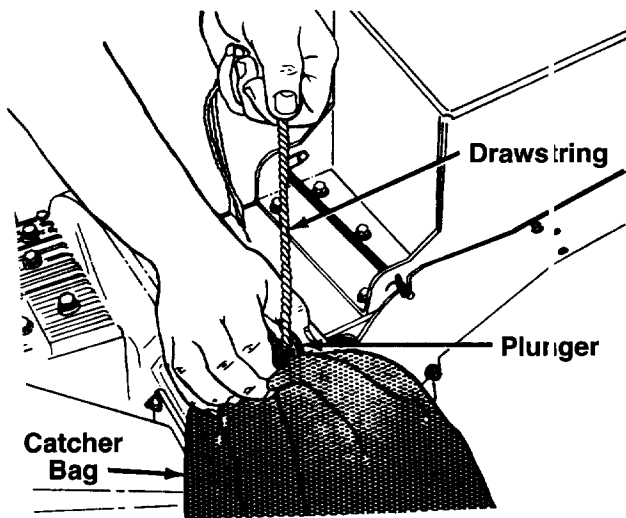


FIGURE 5.

ATTACHING THE CATCHER BAG

Your shredder is equipped with a catcher bag to catch the shredded material.

To attach the bag, place the opening of the bag over the chute deflector so it completely covers the chute opening. Depress the plunger on the drawstring, pull on the drawstring until the bag is tight around the chute opening. Release plunger to lock it into position.

← See figure 5.

OPERATION

KNOW YOUR SHREDDER

READ THIS OWNER'S MANUAL AND SAFETY RULES BEFORE OPERATING YOUR SHREDDER. Compare the illustrations with your shredder to familiarize yourself with the location of various controls and adjustments. Save this manual for future reference.

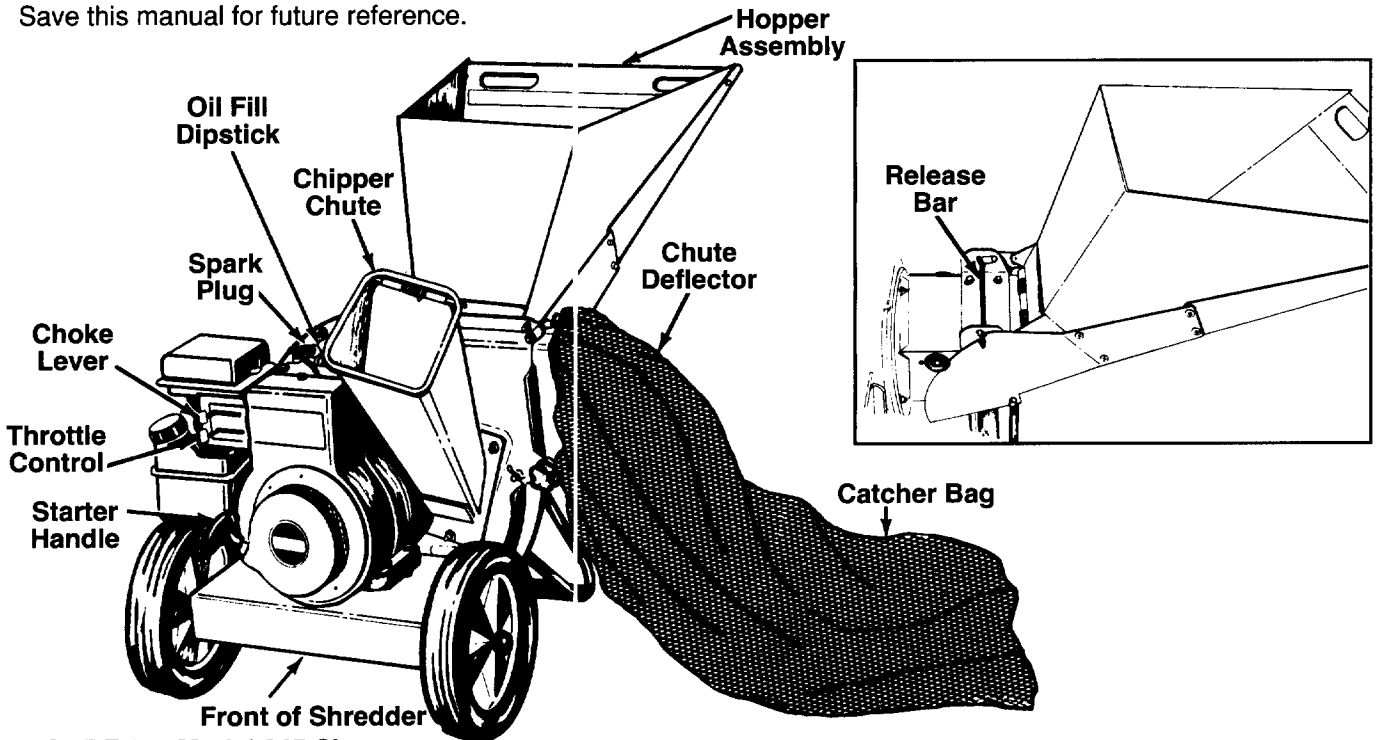


FIGURE 6.—Model 645 Shown

OPERATING CONTROLS (See figure 6)

RELEASE BAR—Used to release the leaf ramp when raising or lowering.

CHOKE LEVER—Used to enrich the fuel mixture in the carburetor when starting a cold engine.

STARTER HANDLE—Used to manually start the engine.

THROTTLE CONTROL—Controls engine speed and stops the engine.

The operation of any shredder can result in foreign objects being thrown into the eyes, which can result in severe eye damage. Always wear safety glasses or eye shields. We recommend wide vision safety mask for over spectacles or standard safety glasses.



BEFORE STARTING

1. Place the shredder on a firm, level surface.
2. Service engine with gasoline and oil as instructed in the separate engine manual packed with your shredder.
3. Attach spark plug wire to spark plug.
4. **Model 650 only:** Open fuel shut-off valve, located beneath the fuel tank.

TO START ENGINE



WARNING: Be sure no one other than the operator is standing near the shredder while starting or operating.

NOTE: Check the fuel level periodically to avoid running out of gasoline while operating the shredder. If the unit runs out of gas as it is shredding or chipping, it may be necessary to unclog the unit before it can be restarted. Refer to "Removing the Flail Screen" on page 9.

1. Place the throttle control lever in FAST position. See figure 7.
2. Move choke lever to CHOKE position (a warm engine may not require choking).
3. Grasp starter handle (see figure 8) and pull rope out slowly until engine reaches start of compression cycle (rope will pull slightly harder at this point). Let the rope rewind slowly.
4. Pull rope with a rapid, continuous, full arm stroke. Keep a firm grip on starter handle. Let rope rewind slowly. Do not let starter handle snap back against starter.
5. Repeat preceding instructions 3 and 4 until engine fires. When engine starts, move choke lever on engine halfway between CHOKE and RUN.

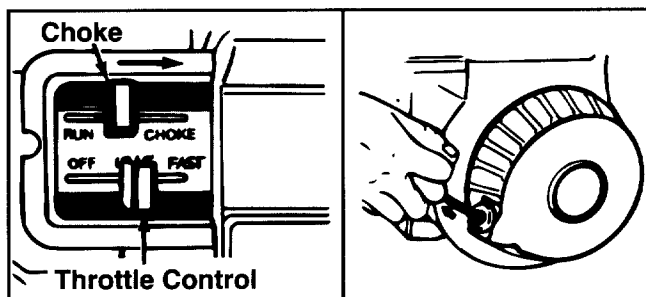


FIGURE 7.— Model 645 Shown

6. Move throttle control to IDLE position for a few minutes warm-up. Move choke lever to RUN position as engine warms up.

TO STOP ENGINE

1. Move throttle control lever to OFF position. See figure 7.

2. Disconnect spark plug wire and move away from spark plug to prevent accidental starting while equipment is unattended.
3. **Model 650 only:** Close fuel shut-off valve when equipment is not in use to prevent fuel leakage.

HOW TO USE YOUR SHREDDER

Do not attempt to shred or chip any material other than vegetation found in a normal yard (i.e., branches, leaves, twigs, etc.).



WARNING: The shredder discharges material with considerable velocity. Keep away from the area around the chute deflector. Always stop the engine and disconnect the spark plug wire when removing or attaching the bag, when changing containers or when removing the shredded material, wear safety glasses and gloves whenever using your shredder.

1. Leaves and small branches up to 1/2" diameter can be fed into the hopper when it is in the raised position. See figure 8. If it becomes necessary to push material into the shredder, use a small diameter stick—NOT YOUR HANDS. The stick cannot exceed 1/2" in diameter so it will be ground up if it gets into the impeller assembly.



WARNING: Do not put material larger than 1/2" in diameter into the hopper. Material up to a maximum of 3" in diameter material may be fed into the chipper chute. Do not attempt to shred or chip any material larger than 3" in diameter. Personal injury or damage to the machine could result.

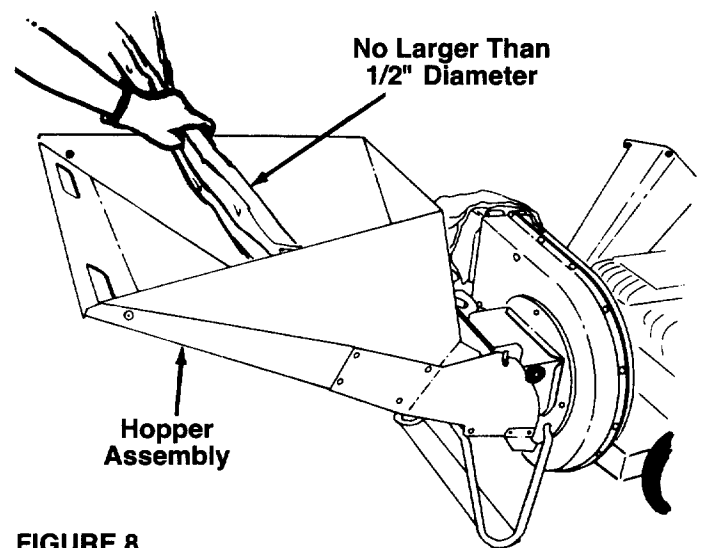


FIGURE 8.

2. Leaves and small twigs can be raked into the shredder when the hopper assembly is lowered to the ground. See figure 9.

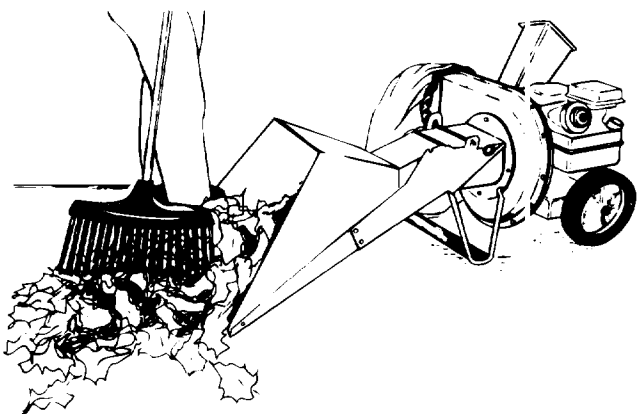


FIGURE 9.

To lower the hopper assembly, use one hand to grasp the handle at the top of the hopper assembly and lift slightly. Pull up on the release bar, and lower the hopper assembly to the ground. Release the bar. See figure 10.

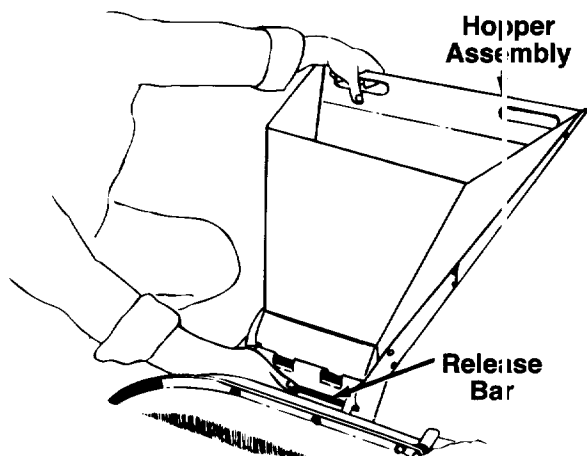


FIGURE 10.

3. Bulky material, such as stalks or heavy branches, up to 3" in diameter should be fed into the chipper chute. See figure 11.



WARNING: Make certain the chipper chute door is closed when not in use.

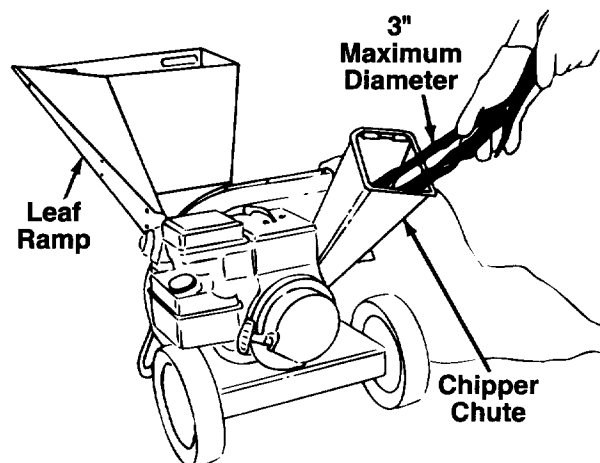


FIGURE 11.

IMPORTANT: There is a flail screen located inside the housing in the discharge area. If the flail screen becomes clogged, remove and clean as instructed in the Maintenance section on page 9.

For best performance, it is important to keep the shredding blade and the chipper blades sharp. Refer to Maintenance section, pages 9 and 10. If the composition of the material being discharged changes (becomes stringy, etc.) or if the rate at which the material is discharged slows down considerably, it is likely that the shredding blade and/or chipper blades are dull and need to be sharpened or replaced.

MAINTENANCE



WARNING: Always stop engine and disconnect spark plug wire before cleaning, lubricating or performing any repairs or maintenance.

LUBRICATION

Lubricate the pivot points on the release bar, guide extension assembly, chute deflector and chipper chute once a season using a light oil.

ENGINE

Refer to the separate engine manual for engine maintenance instructions.

Maintain **engine oil** as instructed in the separate engine manual packed with your unit. Read and follow instructions carefully.

Service **air cleaner** every 25 hours under normal conditions. Clean every few hours under extremely dusty conditions. Poor engine performance and flooding usually indicates that the air cleaner should be serviced. To service the air cleaner, refer to the separate engine manual packed with your unit.

The **spark plug** should be cleaned and the gap reset once a season. Spark plug replacement is recom-

mended at the start of each season; check engine manual for correct plug type and gap specifications.

Clean the engine regularly with a cloth or brush. Keep the cooling system (blower housing area) clean to permit proper air circulation which is essential to engine performance and life. Be certain to remove all dirt and combustible debris from muffler area.

CLEANING

The shredder may be cleaned by running water from a hose through the hopper assembly and chipper chute with the engine running. Allow the shredder to dry thoroughly.

Wash the bag periodically with water. Allow to dry thoroughly in the shade. Do not use heat.

REMOVING THE FLAIL SCREEN

If the discharge area becomes clogged, remove the flail screen and clean area as follows.

1. Stop the engine, make certain the shredder has come to a complete stop and disconnect spark plug wire from the spark plug before unclogging the chute.
2. Loosen the two hand knobs on each side of the chute deflector. Lift the chute deflector up, and tie it out of the way.
3. Remove two hairpin clips from the clevis pins which extend through the housing. Remove the clevis pins. Lift the flail screen from inside the housing. See figure 12.
4. Clean the screen by scraping or washing with water. Reinstall the screen.

NOTE: Be certain to reassemble the flail screen with the curved side down as shown in figure 12.

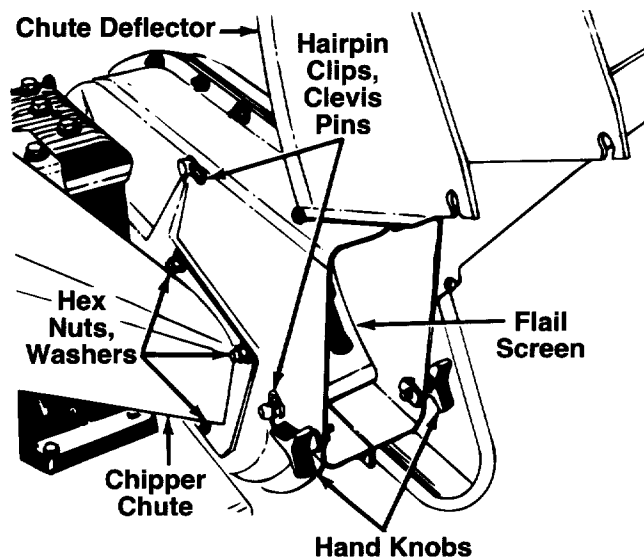


FIGURE 12.

SHARPENING OR REPLACING CHIPPER BLADES

1. Disconnect spark plug wire and move it away from spark plug.
2. Remove the flail screen as instructed in previous section.
3. Remove the chipper chute by removing three hex nuts and washers. A 1/2" wrench is required. See figure 12.

NOTE: When reassembling, the cupped washer goes on the bottom of the chipper chute with the cupped side against the chute.

4. Rotate the impeller assembly by hand until you locate one of the chipper blades in the chipper chute opening. Remove the blade, using a 3/16" allen wrench on the outside of the blade and 1/2" wrench on the impeller assembly (inside the housing). See figure 13.
5. Remove the other blade in the same manner.

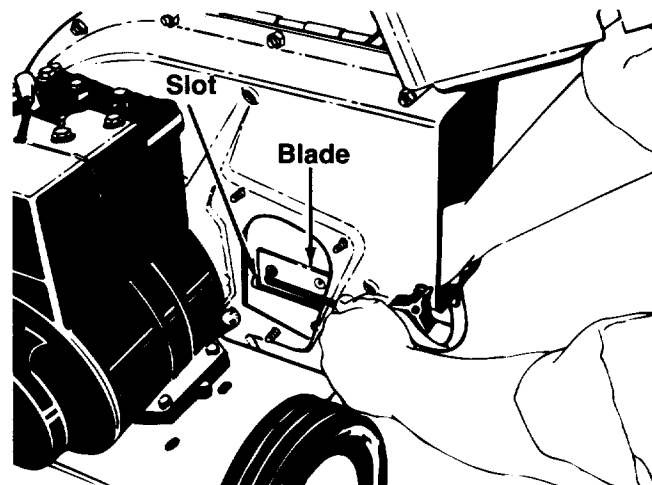


FIGURE 13.

Replace or sharpen blades. If sharpening, make certain to remove an equal amount from each blade. Reassemble in reverse order.

Make certain blades are reassembled with the sharp edge facing the direction shown in figure 14 (sharp edge is assembled toward the slotted opening in the impeller assembly).

SHARPENING OR REPLACING SHREDDING BLADE

The shredding blade may be removed for sharpening or replacement as follows.

1. Disconnect spark plug wire and move it away from spark plug.
2. Lower the hopper assembly. Block up the housing. See figure 14.
3. Remove the six hex lock nuts and lock washers from the housing weld bolts using a 1/2" wrench. Separate the shredder into two halves.
4. Remove the back-up plate.

NOTE: When reassembling, make certain the opening on the back-up plate is toward the bottom of the unit. The back-up plate may be reversed to provide a new cutting edge.

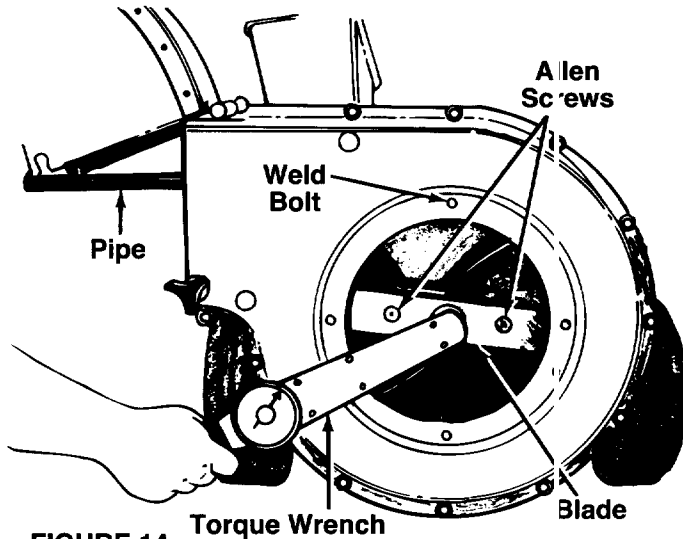


FIGURE 14.

5. Loosen the two hand knobs and cupperl washers which secure the chute deflector, and raise the chute deflector.
6. Keep the impeller assembly from turning by inserting a 1/2" or 3/4" diameter pipe through the flail screen, or remove the flail screen, and insert a piece of wood (2 x 4) into the chute opening.
7. Remove the two outside screws on the blade, using a 3/16" allen wrench and a 1/2" wrench.
8. Remove the blade by removing the center bolt, lock washer and flat washer.

NOTE: Use caution when removing the blade to avoid contacting the weld bolts on the housing.

When sharpening the blade, follow the original angle of grind as a guide. It is extremely important that each cutting edge receives an equal amount of grinding to prevent an unbalanced blade. An unbalanced blade will cause excessive vibration when rotating at high speeds and may cause damage to the unit.

The blade can be tested for balance by balancing it on a round shaft screwdriver or nail. Remove metal from the heavy side until it is balanced evenly. See figure 15.

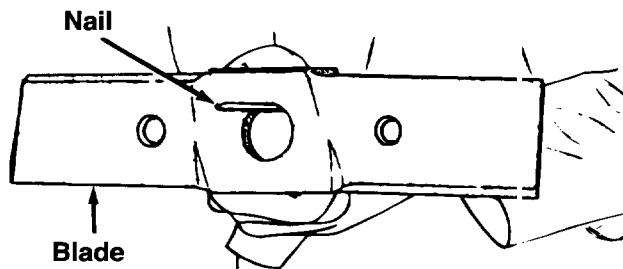


FIGURE 15.

When reassembling the blade, tighten to between 550 and 650 inch pounds, or lacking torque wrench, tighten securely.

FLAILS

The flails, located inside the housing, may be reversed when they become dull. It is suggested that this procedure be performed by your nearest authorized dealer.

CARBURETOR ADJUSTMENT



WARNING: If any adjustments are made to the engine while the engine is running (e.g. carburetor), keep clear of all moving parts. Be careful of heated surfaces and muffler.

Minor carburetor adjustment may be required to compensate for differences in fuel, temperature, altitude or load.

NOTE: A dirty air cleaner will cause engine to run rough. Be certain air cleaner is clean and attached to the carburetor before adjusting carburetor.

Do not make unnecessary adjustments. Factory settings are satisfactory for most applications and conditions. If adjustment is needed, refer to the separate engine manual packed with your shredder.

OFF-SEASON STORAGE

The following steps should be taken to prepare your shredder for storage.

1. Clean and lubricate the shredder thoroughly.
2. Refer to engine manual for correct engine storage instructions.
3. If storing in an unventilated or metal storage shed, coat metal parts with a light oil or silicone to prevent rust.
4. Store in a dry, clean area. Do not store next to corrosive materials, such as fertilizer.

TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Engine fails to start	<ol style="list-style-type: none"> 1. Fuel tank empty, or stale fuel. 2. Spark plug wire disconnected. 3. Faulty spark plug. 	<ol style="list-style-type: none"> 1. Fill tank with clean, fresh fuel. 2. Connect wire to spark plug. 3. Clean, adjust gap or replace.
Loss of power; operation erratic	<ol style="list-style-type: none"> 1. Spark plug wire loose. 2. Unit running on CHOKE. 3. Blocked fuel line or stale fuel. 4. Fuel shut-off valve closed (if so equipped). 5. Water or dirt in fuel system. 6. Carburetor out of adjustment. 7. Dirty air cleaner. 	<ol style="list-style-type: none"> 1. Connect and tighten spark plug wire. 2. Move choke lever to OFF position. 3. Clean fuel line; fill tank with clean fresh gasoline. 4. Open fuel shut-off valve. 5. Disconnect fuel line at carburetor to drain fuel tank. Refill with fresh fuel. 6. Adjust carburetor. † 7. Service air cleaner. †
Engine overheats	<ol style="list-style-type: none"> 1. Carburetor not adjusted properly. 2. Engine oil level low. 	<ol style="list-style-type: none"> 1. Adjust carburetor. † 2. Fill crankcase with proper oil.
Too much vibration	Loose parts or damaged impeller.	Stop engine immediately and disconnect spark plug wire. Tighten all bolts and nuts. Make all necessary repairs. If vibration continues, have unit serviced by an authorized service dealer.
Unit does not discharge	<ol style="list-style-type: none"> 1. Discharge chute clogged. 2. Foreign object lodged in impeller. 	<ol style="list-style-type: none"> 1. Stop engine immediately and disconnect spark plug wire. Clean flail screen and inside of housing. See Maintenance section of this manual. 2. Stop engine immediately and disconnect spark plug wire. Remove lodged object.
Rate of discharge slows considerably or composition of discharged material changes	Shredding blade and/or chipper blades dull.	Sharpen or replace shredding and chipper blades.

†Refer to the engine manual packed with your unit.

NOTE: For repairs beyond the minor adjustments listed above, please contact your nearest authorized service dealer.

Model No.	-645C	-648C	-650C / -651C
Spark Plug	J19LM	J17M	J19LM
Air Filter Element	491588	33268	393957
Air Pre-Cleaner	491435	35881	271794
Engine Oil (SAE 30)	737-0208 (21 oz. req'd.)	737-0208 (26 oz. req'd.)	737-0208 (44 oz. req'd.)
Chipper Blade (Tooled Steel)	742-0544	742-0544	742-0544
Shredding Blade	742-0571	742-0571	742-0571
Bag	764-0199A	764-0199A	764-0199A
Safety Glasses	723-0400	723-0400	723-0400

The only way to ensure the performance of your product is to use original equipment parts and accessories, which are designed and engineered to exacting specifications. When you substitute, you take a chance on quality, reliability, safety and performance. Use original equipment parts—See your local service dealer.

For Replacement Parts, Contact:
SERVICE DEPARTMENT • P.O. BOX 368022 • CLEVELAND, OHIO 44136-9722